



Weight and social comparison

Does the weight of a stranger affect a person's perception of their own weight?

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Weight and social comparison: Does the weight of a stranger affect a person's perception of their own weight?

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Abstract

Research suggests that social context affects individuals' perception of their own weight. Using face-to-face interviews as the social context, we analyze the effect of interviewers' ($N=90$) body mass index on respondents' ($N=3068$) self-perceived weight level. Respondents reported a higher weight level when the interviewer had a higher body mass index (absolute social comparison). Female respondents reported a lower weight level if interviewers had a higher body mass index than they did (relative social comparison). Results suggest that weight perception reflects both absolute and relative social comparison, especially among women. Future research should consider causation and self-selection when studying social context and body image.

Keywords

body mass index, gender, social comparison, social context, weight perception

Introduction

Following the increasing prevalence of obesity around the world in recent decades (Caballero, 2007; World Health Organization (WHO), 2000)—including Denmark, which is the country studied in this article (Danish Health Authority, 2017; Due et al., 2007)—scholars have attempted to map the different factors that contribute to this development. Obesity is associated with premature mortality and a variety of chronic diseases, such as diabetes, cardiovascular disease, and cancer (Renehan et al., 2008; Wang et al., 2011). In addition, to the negative health consequences for the individual person with weight issues, the increasing prevalence of obesity has also led to an increase in health-care expenditure (Withrow and Alter, 2011). Research suggests that changes in the social perceptions of what constitutes overweight and obesity may contribute to the increased prevalence of obesity (Burke et al., 2010; Johnson et al., 2008; Johnson-Taylor et al., 2008). The growing prevalence of overweight and obesity could change the subjective threshold for what most people consider a “normal” weight level, thereby resulting in under-detection of overweight and obesity (Robinson, 2017). This explanation highlights the fact that social context affects weight

perceptions (Hammond, 2010; Leahey et al., 2011b; Mueller et al., 2010; Robinson and Kirkham, 2014) because individuals adjust perceptions of their own weight based on the weight of those around them (Ali et al., 2011; Burke and Heiland, 2007; Maximova et al., 2008; Robinson, 2017). As research also documents positive correlations between the weight level of family members (Brown and Roberts, 2012; Christakis and Fowler, 2007) and social peers (Ali et al., 2012; Hammond and Ornstein, 2014; Trogon et al., 2008; Zhang et al., 2018), the increasing prevalence of obesity in the social contexts in which individuals fare may account for some of the recent increase in obesity reported around the world.

Although there is correlational evidence that social context affects individuals' perception of their own weight, it is not clear whether these correlations have a causal

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interpretation (Hammond, 2010). The main inferential challenge is that individuals with certain lifestyles that affect their weight may self-select into the company of others with a similar lifestyle (and weight). Self-selection means that it is difficult to isolate the causal effect of social context from the effect of other similarities in lifestyles among individuals who inhabit the same social context (Ali et al., 2011, 2012; Brown and Roberts, 2012). In this article, we provide new evidence on the effect of social context on individuals' perception of their own weight. We draw on survey data from Denmark, which include the children of a nationally representative sample, and treat a face-to-face interview lasting approximately 1 hour as a social context that might affect the respondent's weight perception. We address self-selection into social contexts by exploiting the fact that interviewers ($N=90$) were randomly assigned de facto to respondents ($N=3303$) and, as a consequence, respondents had no control over which interviewer they would encounter. This means that the interviewer's physical appearance is unlikely to be related to other lifestyle factors that affect the respondent's perception of his or her own weight, such as eating habits or leisure activities. Previous research addressing the impact of social context on own body perceptions has mostly focused on media images (rather than exposure to real people) (Bould et al., 2018; Brown and Tiggemann, 2016), used selective samples such as children or adolescents (Ali et al., 2011; Maximova et al., 2008), and only a few studies have included strangers as the social comparison group (see the literature review by Myers and Crowther, 2009).

In addition to de facto randomization of interviewers, the survey that we use also collected information on both respondents' and interviewers' body mass index (BMI). We use this information to analyze whether, net of respondents' own BMI, interviewers' BMI affects respondents' perceptions of their own weight. We argue that the mechanism through which the interviewer's BMI might affect weight perception is via social comparison. Social comparison theory (Festinger, 1954) argues that we compare ourselves with others in order to make evaluations about our own and others' characteristics, especially when objective points of reference do not exist. According to social comparison theory, the interviewer's BMI affects the respondents' perception of their own weight because the interviewer's physical appearance provides a visual point of reference (Krones et al., 2005; Leahey and Crowther, 2008; Leahey et al., 2011a). Moreover, the effect of social comparison may be asymmetric in the sense of being negative when the comparison is upward (i.e. when respondents compare themselves with someone who has a lower BMI than they do) and positive when it is downward (i.e. when respondents compare themselves with someone who has a higher BMI than they do; Frederick et al., 2017; Groesz et al., 2002; Owen and Spencer, 2013; Tucci and Peters, 2008). Therefore, in addition to making an *absolute* social comparison (via the

interviewer's BMI), respondents may also make a *relative* social comparison by evaluating their own weight in light of the difference between their own weight and that of the interviewer (Leahey and Crowther, 2008; Papies and Nicolaije, 2012). We investigate whether absolute and relative social comparisons affect weight perception by including a measure of the interviewer's BMI and a measure of whether the interviewer's BMI is higher than that of the respondent. Based on findings from previous research, we hypothesize that absolute social comparison would lead respondents to rate themselves as belonging to a lower weight category, if the interviewer with whom they interact has a higher BMI than they do. Similarly, relative social comparison would lead respondents to rate themselves as belonging to a lower weight category, if their interviewer has a higher BMI than they do (downward relative comparison) and to rate themselves as belonging to a higher weight category, if their interviewer has a higher BMI than they do (upward social comparison). Thus, we hypothesize that, when making a relative social comparison, respondents facing an interviewer with a higher BMI than their own will compare themselves favorably to that person, whereas a respondent facing an interviewer with a lower BMI will compare unfavorably (Myers and Crowther, 2009).

We also analyze gender differences in the effect of social context on weight perception. Research shows that men tend to underestimate their weight, while women tend to overestimate theirs (Wardle et al., 2006). Women also more often than men report trying to lose weight (Lemon et al., 2009; Yaemsiri et al., 2011), they are more dissatisfied with their bodies (Stanford and McCabe, 2002), and are more responsive to body images generated by mass media (Grabe et al., 2008; Groesz et al., 2002; Smeesters et al., 2009). These findings suggest that women's perception of their own weight is more strongly influenced by social contexts than men's, and also that they are more likely to make both absolute and relative social comparisons. We test this assumption by carrying out our analysis separately for men and women.

Materials and methods

Data

We analyzed data from the Danish Longitudinal Survey of Youth—Children (DLSY-C). The DLSY-C includes the children of a nationally representative sample of participants in an ongoing cohort study, the Danish Longitudinal Survey of Youth (DLSY). Participants in the DLSY (3151 in total) were all born in or around 1954, and the DLSY-C samples all children born to all DLSY respondents. The DLSY-C included questions about a range of issues, such as respondents' family background, educational attainment, occupation, and family situation. Mean age is 27.1 in the DLSY-C, the response rate is 81 percent, and the DLSY-C

includes 3518 respondents who were interviewed face-to-face in their own home by an interviewer (interviews lasted approximately 1 hour). We excluded 216 respondents under the age of 18 years because the weight level of children and adolescents is calculated differently from that of adults, which limits the sample to 3303 respondents. After excluding respondents and interviewers with missing values on one or more of the included variables, the final analysis sample included 3068 respondents and 90 interviewers.

The interviewers who carried out the face-to-face interviews were employed by the survey agency that collected the DLSY-C, and most interviewers worked part-time and had additional means of income. The interviewers were recruited based on their place of residence and carried out interviews in the region of Denmark in which they lived. Denmark is a small country (its land mass is approximately 0.5% of that of the United States) and has a high population density, a high level of socioeconomic equality, and low levels of residential and ethnic segregation. For the DLSY-C, the survey agency in charge of the DLSY-C sent interviewers a list of names and addresses of the respondents that had been assigned to them. Thus, while the DLSY-C did not assign interviewers to respondents via a randomized controlled trial, in effect respondents had no control over which interviewer they would meet. We exploit this quasi-random allocation of interviewers to respondents to analyze the effect of interviewer BMI on respondents' weight perception.

Dependent variable

The dependent variable in the analysis was the respondent's assessment of his or her own weight level using a 5-point ordered scale with the following categories: (1) "underweight," (2) "normal weight," (3) "slightly overweight," (4) "overweight," and (5) "obese." Table 1 provides summary statistics for all variables included in the analysis.

Explanatory variables

Our main explanatory variables were the respondent's BMI, the interviewer's BMI, and a dummy variable that took the value 1 if the interviewer's BMI was higher than that of the respondent (and 0 otherwise). Weight levels are most often measured by the BMI, which is calculated by dividing weight in kilograms by height in meters squared. A BMI below 18.5 is considered underweight, a BMI between 18.5 and 24.9 normal weight, a BMI between 25 and 29.9 overweight, a BMI between 30 and 34.9 obese, and a BMI of 35 and above morbidly obese (WHO, 2000). The respondents and the interviewers were asked to state their weight in kilograms and height in centimeters, and we calculated their BMI based on these self-reports.

Our survey data also included an indicator for the interviewer's subjective assessment of the respondent's weight

(in five categories ranging from underweight to obese; the respondent did not know that the interviewer made this assessment).¹ This measure is relevant because, unlike BMI, it captures the respondent's physical appearance in a way that takes body composition, fat distribution, and muscularity into account. We argue that this measure is a supplement to the information we have on the respondent's BMI, and we expect it to be positively associated with respondents' own weight assessment above and beyond the effect of BMI. We are not familiar with any previous research that includes a stranger's assessment of the respondent's weight. Studies exist that analyze weight assessments by others, but these studies use selective samples (Christensen, 2012; Doolen et al., 2009; Pulvers et al., 2008; Tovee et al., 2000; Vella-Zarb and Mills, 2011) and only a few include measures of both the respondent's and the observer's assessment of the respondent's weight (Goodman et al., 2000; Pulvers et al., 2008; Uccula and Nuvoli, 2017).

In addition to the main explanatory variables, we also included a range of control variables. For respondents, we included control variables measuring gender (a dummy variable for women), age in years, educational attainment (a dummy variable for having completed upper secondary education, the college-bound track in Danish secondary education), and marital status (a dummy variable for being married or cohabitating). For interviewers, we included control variables measuring gender (a dummy variable for women), age in years, and years of experience as an interviewer. Table 1 provides summary statistics.

Our dependent variable was categorical and ordered. We estimated ordinal logistic regression models in which we regressed the respondent's weight perception on the respondent's BMI, the interviewer's BMI, the dummy variable capturing whether the interviewer had a higher BMI than the respondent, and the interviewer's assessment of the respondent's weight level, as well as the control variables. We report log-odds estimates and average marginal effects (AMEs) for the different response categories on the dependent variable. All reported standard errors adjust for clustering of respondents within interviewers. We used Stata for all analyses and ran the analysis for the full sample as well as separately for men and women.

Results

Table 2 summarizes results from ordinal logistic regressions of respondents' weight perception in the full sample and models run separately for men and women. Consistent with results from previous research, the table shows that women tended to rate their own weight level higher than men, net of actual BMI. Unsurprisingly, the respondent's BMI had a positive and statistically significant effect on the likelihood that the respondent reported belonging to a higher weight category. Results were identical when we ran

Table 1. Summary statistics: means, percentages, and standard deviations.

	All			Women			Men		
	Mean/%	SD	N	Mean/%	SD	N	Mean/%	SD	N
<i>Respondent</i>									
Weight assessment			3300			1731			1569
Underweight	5.9			3.5			8.5		
Normal weight	59.6			58.3			61.1		
Slightly overweight	25.0			26.0			23.8		
Overweight	7.5			9.4			5.5		
Obese	2.0			2.8			1.2		
BMI	24.4	4.6	3252	23.9	4.9	1694	25.0	4.2	1558
Sex (female)	52.5		3303			1734			1569
Age	27.8	5.1	3303	27.9	5.1	1734	27.7	5.1	1569
Upper secondary education	65.8		3303	76.5		1734	54.1		1569
Married/cohabitating	57.0		3303	62.0		1734	51.7		1569
<i>Interviewer</i>									
BMI	25.5	3.5	90						
BMI higher than respondent	61.2		3303						
Weight assessment			3303						
Underweight	7.0								
Normal weight	66.1								
Slightly overweight	17.6								
Overweight	6.8								
Obese	2.6								
Sex (female)	47.9		94						
Age	62.8	9.2	94						
Experience	6.0	6.6	91						

SD: standard deviation; BMI: body mass index.

the models separately for men and women. Similarly, the interviewer's subjective assessment of the respondent's weight level was highly significantly related to the respondent's self-reported weight level both among men and women. As expected, we found that being rated as belonging to a higher weight category by the interviewer was associated with a higher likelihood of respondents' reporting belonging to a higher weight category, net of actual BMI. We interpret this effect as capturing the influence of a richer assessment of the respondent's physical appearance than what is conveyed by BMI.

Furthermore, results showed that the interviewer's BMI had a positive and statistically significant effect on the respondent's weight perception (we evaluate marginal effects below). This finding is consistent with the hypothesis that social context, in this case a face-to-face interview with a de facto randomly assigned interviewer, affects weight perception. Net of their own BMI and other characteristics, respondents rated their weight level as being higher if they were interviewed by an interviewer with a high BMI than if they were interviewed by an interviewer with a low BMI. Models run separately for men and women showed that the effect of the interviewer's BMI on own weight perception existed both among women and men, although the estimate was

larger for women. These results go against our initial hypothesis regarding the direction of the effect of the interviewers' BMI on respondents' weight perception. Previous research would suggest the opposite effect. However, the results may indicate that facing an interviewer with a BMI on the upper end of the BMI scale leads respondents to become more accepting of their own weight and to feel less inclined to place themselves in a lower weight category. Furthermore, this result should be seen in the light of the relative comparison that also takes place. Table 2 shows that relative social comparison matters as well. In the full sample, we found a negative and statistically significant effect of the dummy variable capturing whether the interviewer's BMI is higher than the respondent's BMI on the likelihood of reporting belonging to a higher weight category. This means that respondents were less likely to report belonging to a higher weight category if the interviewer with whom they interacted had a higher BMI than they did.² When we ran the models separately for men and women, we found that this effect was significant only for women. We interpret the results as suggesting that, though being interviewed by an interviewer with a high BMI generally leads people to rate themselves as belonging to a higher weight category (absolute social comparison), this effect is counterbalanced among women when

Table 2. Results from ordinal logistic regression models of weight assessment: log-odds estimates with standard errors in parentheses.

Dependent variable	Weight assessment		
	All	Women	Men
Respondent			
BMI	0.44 (0.04)***	0.44 (0.04)***	0.45 (0.06)***
Sex (female)	1.22 (0.10)***		
Age	0.01 (0.01)	0.02 (0.01)	-0.01 (0.02)
Upper secondary education	-0.01 (0.10)	-0.08 (0.14)	0.03 (0.14)
Married/cohabitating	0.13 (0.10)	0.11 (0.12)	0.17 (0.16)
Interviewer			
BMI	0.06 (0.02)***	0.08 (0.02)***	0.05 (0.03)*
BMI higher than respondent	-0.52 (0.18)**	-0.66 (0.24)**	-0.34 (0.21)
Weight assessment	1.65 (0.16)***	1.48 (0.20)***	1.85 (0.20)***
Sex (female)	-0.22 (0.11)*	-0.28 (0.13)*	-0.14 (0.15)
Age	-0.01 (0.01)	-0.01 (0.01)*	-0.002 (0.007)
Experience	0.002 (0.001)	0.01 (0.01)	-0.004 (0.010)
Log-likelihood	-1750	-897	-844
N	3068	1604	1464
Pseudo R ²	0.47	0.48	0.45

BMI: body mass index.

All standard errors adjust for clustering of respondents within interviewers.

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

they face an interviewer whose BMI is higher than their own (relative social comparison). Thus, the results suggest that women are more strongly affected by the interviewer's BMI than men and are more likely to make social comparisons when assessing their own weight level.³ Women who compared favorably with their interviewer in terms of weight (downward social comparison) perceived themselves as lighter compared to those who compared unfavorably (upward social comparison). This result is consistent with social comparison theory (Festinger, 1954). Men's weight perception was only weakly affected by the interviewer's BMI and is unrelated to the relative difference in BMI. We return to these gendered differences in the discussion.

Interestingly, we also found that women interviewed by a female interviewer rated themselves as belonging to a lower weight category than did women interviewed by a male interviewer, regardless of interviewer BMI. These results indicate that not only do women engage in social comparisons to a greater extent than men, the gender of the person with whom they compare themselves also affects their weight perception. We also return to this point in the discussion.

Table 3 summarizes AMEs of interviewer BMI, the dummy variable indicating whether the interviewer's BMI is higher than that of the respondent, and the interviewers' assessment of the respondent's weight level. We calculated the AMEs from the ordered logit models in Table 2, and they express the average change in the probability of belonging to each of the five weight categories that follows from a change of one unit in each interviewer characteristic

(while holding other factors constant at their means). First, the table shows that the AMEs for interviewer BMI were negative at low values of the dependent variable (especially "normal weight"), positive at moderate values ("slightly overweight"), and effectively zero at high values ("overweight" and "obese"). These results suggest that the main substantive effect of interviewer BMI is to move respondents from reporting being of "normal weight" to reporting being "slightly overweight." Second, women (but not men) who were interviewed by an interviewer with a higher BMI than their own were slightly less likely to report being "underweight" (0.3 percentage points), significantly more likely report being of "normal weight" (15.5 percentage points), significantly less likely to report being "slightly overweight" (15.3 percentage points), and slightly less likely to report being "overweight." We argued that this effect reflects relative social comparison. Finally, we found that respondents (both men and women) who were rated as belonging to a higher weight category by their interviewer were substantially more likely to report belonging to a higher weight category (even after controlling for their own BMI). For example, respondents who were rated one category higher on the ordered weight level scale were 34.6 percentage points less likely to report being of "normal weight" and 35.2 percentage points more likely to report being "slightly overweight." Given that our results were practically identical for men and women, we interpret the effect of the interviewer's subjective assessment of the respondent's weight level as reflecting a richer measurement of respondents' physical appearance than what we

Table 3. Summary of average marginal effects for each outcome of the dependent variable in models estimated in Table 2.

Weight assessment	Underweight	Normal weight	Slightly overweight	Overweight	Obese
<i>Interviewer</i>					
BMI					
All	−0.000	−0.013	0.013	0.000	0.000
Women	−0.000	−0.017	0.017	0.000	0.000
Men	−0.001	−0.008	0.009	0.000	0.000
BMI higher than respondent					
All	0.004	0.109	−0.111	−0.002	−0.000
Women	0.003	0.155	−0.153	−0.005	−0.000
Men	–	–	–	–	–
Weight assessment					
All	−0.013	−0.346	0.352	0.007	0.000
Women	−0.006	−0.351	0.347	0.010	0.000
Men	−0.026	−0.314	0.336	0.004	0.000

BMI: body mass index; AME: average marginal effects.

We do not calculate AMEs for BMI higher than the respondent for men, as the effect was not significant in the ordinal logistic regression including men only.

captured via their BMI. Marginal effects were much higher for the low- and middle-range weight categories than for the highest weight categories. This result also supports the interpretation that the interviewer's weight assessment captures other aspects of physical appearance, such as fat percentage and amount of adipose tissue. One would expect a substitution of adipose tissue by muscle mass to be especially apparent at lower weight levels.

Discussion

Existing research suggests that social contexts and social comparisons affect individuals' weight perceptions and weight levels (Burke and Heiland, 2007; Hammond, 2010; Robinson, 2017). In this article, we add to existing research by analyzing the extent to which the BMI of a stranger with whom a person spends around 1 hour affects that person's assessment of his or her own weight. We exploited plausibly exogenous variation in the other person's BMI (arising from interviewers being de facto randomly assigned to respondents in face-to-face interviews) to estimate the effect of "contextual" BMI on individuals' own weight perceptions. By doing so, we addressed potential endogeneity bias arising from individuals self-selecting into social contexts populated by peers with similar BMI and self-perceptions. We report several substantive findings.

First, we found that the BMI of the interviewer, a stranger, affected individuals' assessment of their own weight. The results persisted even after we controlled for individuals' own BMI and other characteristics, and they corroborate the hypothesis that the physical appearance of others has an independent effect on individuals' weight perception. Respondents rated their own weight level as higher if they were interviewed by an interviewer with a high BMI. Moreover, women interviewed by an interviewer with a higher BMI than their own rated their weight level lower compared to women

interviewed by an interviewer with the same or a lower BMI. These results were in accordance with the hypothesis that individuals take cue from social contexts when evaluating their own weight level and, furthermore, that downward and upward social comparisons have different implications (Festinger, 1954; Tantleff-Dunn and Gokee, 2002). In relation to the increasing prevalence of obesity in most countries, this result could indicate that, when surrounded by people with a high BMI, women might underestimate their actual weight, which possibly contributes to a higher risk of obesity. Women who do not see themselves as overweight, despite having a BMI which suggests that they are, will be less motivated to lose weight. However, recent decades have seen an increase in body consciousness and body dissatisfaction, with potential negative psychological consequences and risk of increasing eating psychopathologies, not only among overweight but also among normal and underweight individuals (Furnham et al., 2002). Ample research documents links between social context and body perceptions, through media consumption and/or peer influence (see the review by Myers and Crowther, 2009). With growing levels of body dissatisfaction—especially among women—being surrounded by individuals with a high BMI might thus reduce weight dissatisfaction, thereby leading to higher satisfaction with one's own body.

Second, we found notable gender differences in the effect of the interviewer's BMI on the respondent's weight perception that are consistent with results from previous research. Women face stronger social norms than men regarding being slim and thin, and physical appearance is a more important component in the female gender stereotype than in the male gender stereotype (Striegel-Moore et al., 2004; Striegel-Moore and Franko, 2002). Furthermore, women are more prone than men to making social comparisons concerning their weight (Chen and Jackson, 2012; Warren et al., 2010). Given that men do not appear to be influenced by the interviewer's weight level relative to their own, it could be the

case that men are happier with reporting a high weight level when they are interviewed by an interviewer with a high BMI, compared to when their interviewer has a low BMI (Blanchflower et al., 2009; Trottier et al., 2007). The stigma for overweight males is quite different than that for women and a certain “masculine” health behavior and appearance of size and robustness are even appreciated (Courtenay, 2000a, 2000b; McCreary and Sasse, 2000; Stibbe, 2004).

Third, we found that women interviewed by a female interviewer tended to report belonging to a lower weight category compared to women interviewed by a male interviewer. We interpreted this finding to suggest that women facing a female interviewer are more likely to comply with social norms emphasizing slimness than those interviewed by a male interviewer. Research suggests that not only is a woman's ideal body size often slimmer than her actual body size, but most women also overestimate the extent to which a slim female figure is attractive to men—and even more so, the extent to which a slim female figure is preferred by other women (Cohn and Adler, 1992; Grogan, 2008; Tantleff-Dunn and Gokee, 2002). The tendency among women to make social comparisons, and the tendency to overestimate the slimness of the preferred female figure, might explain why women (but not men) are affected by the gender of the interviewer. In contrast, the male body ideal is more diverse, with different types of men found to be attractive (Buote et al., 2011). Nonetheless, the male body ideal has also changed in recent decades. While the body ideal emphasizing thinness for women has remained constant over time, the male body ideal has become increasingly muscular (Leit et al., 2000; Pope et al., 1999), which has prompted more men to report dissatisfaction with their bodies (Agliata and Tantleff-Dunn, 2004; Frederick et al., 2007; Tiggemann et al., 2007).

Limitations

Several limitations in the analysis should be highlighted. First, our measures of BMI are based on self-reported height and weight. Self-reports of height and weight are subject to measurement error due to under-reporting of weight and over-reporting of height (Gorber et al., 2007). However, self-reports have been found to be adequate for population studies (McAdams et al., 2007; Spencer et al., 2001). Second, there is an age mismatch in our data because the respondents were less than 30 years old on average and the interviewers were over 60. Social comparison theory predicts that individuals mostly compare themselves with others who are similar to themselves (Festinger, 1954). Arguably, the effect of the interviewer's BMI and weight level assessments would have been even stronger if the interviewers and respondents were of similar age. Third, one could speculate that the respondents' weight perceptions are not genuinely affected by the interviewers' weight, but rather that their survey responses reflect social desirability. Thus, it might be the case that politeness concerns compel respondents to report

belonging to a higher weight category, when their interviewer has a high BMI. On the other contrary, one could also argue that respondents facing an interviewer with a high BMI would instead report a lower perceived weight level so as not to point out that the interviewer with a high BMI also has a high weight level and is perceived as overweight. Therefore, we still believe that weight perception is influenced during the social interaction.

Despite these limitations, our research highlights the importance of looking beyond the individual when analyzing determinants of weight and weight perceptions. In particular, our study illustrates how the physical appearance of a stranger with whom an individual interacts for a short period of time affects the way in which that individual perceives his or her own weight. This result highlights the effect that social context and the weight of people around us have on our own weight perceptions and, arguably, weight level. Moreover, our research points to the need for research that identifies linkages between weight level, weight perception, and social networks, using research designs that distinguish the actual effect of social context from that of self-selection into social context.

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Notes

1. For convenience, we treated the interviewers' assessments of the respondents' weight level as a continuous variable in the empirical analyses. Treating it as a categorical variable did not change any of our substantive findings.
2. As we included both the respondent's body mass index (BMI) and the interviewer's BMI in our models, we could not also include a continuous measure of the relative difference between respondent and interviewer BMI. Instead, we included the dummy variable described above.
3. We tested for interaction effects between the interviewer's BMI and the interviewer's sex to see whether respondents were more strongly affected by the interviewer's BMI if the interviewer was of the same sex as the respondent. None of the interaction effects were statistically significant.

References

- Agliata D and Tantleff-Dunn S (2004) The impact of media exposure on males' body image. *Journal of Social and Clinical Psychology* 23: 7–22.

- Ali MM, Amialchuk A and Renna F (2011) Social network and weight misperception among adolescents. *Southern Economic Journal* 77: 827–842.
- Ali MM, Amialchuk A, Gao S, et al. (2012) Adolescent weight gain and social networks: Is there a contagion effect? *Applied Economics* 44: 2969–2983.
- Blanchflower DG, Oswald AJ and Landeghem BV (2009) Imitative obesity and relative utility. *Journal of the European Economic Association* 7: 528–538.
- Bould H, Carnegie R, Allward H, et al. (2018) Effects of exposure to bodies of different sizes on perception of and satisfaction with own body size: Two randomized studies. *Royal Society Open Science*. Epub ahead of print 9 May. DOI: 10.1098/rsos.171387.
- Brown HW and Roberts J (2012) Exploring the factors contributing to sibling correlations in BMI: A study using the panel study of income dynamics. *Obesity* 20: 978–984.
- Brown Z and Tiggemann M (2016) Attractive celebrity and peer images on Instagram: Effect on women's mood and body image. *Body Image* 19: 37–43.
- Buote VM, Wilson AE, Strahan EJ, et al. (2011) Setting the bar: Divergent sociocultural norms for women's and men's ideal appearance in real-world contexts. *Body Image* 8: 322–334.
- Burke MA and Heiland FW (2007) Social dynamics of obesity. *Economic Inquiry* 45: 571–591.
- Burke MA, Heiland FW and Nadler CM (2010) From “overweight” to “about right”: Evidence of a generational shift in body weight norms. *Obesity* 18: 1226–1234.
- Caballero B (2007) The global epidemic of obesity: An overview. *Epidemiologic Reviews* 29: 1–5.
- Chen H and Jackson T (2012) Gender and age group differences in mass media and interpersonal influences on body dissatisfaction among Chinese adolescents. *Sex Roles* 66: 3–20.
- Christakis NA and Fowler JH (2007) The spread of obesity in a large social network over 32 years. *New England Journal of Medicine* 357: 370–379.
- Christensen VT (2012) Gendered perceptions of own and partner weight-level. *Health* 16: 382–399.
- Cohn LD and Adler NE (1992) Female and male perceptions of ideal body shapes: Distorted views among Caucasian college students. *Psychology of Women Quarterly* 16: 69–79.
- Courtenay WH (2000a) Behavioral factors associated with disease, injury, and death among men: Evidence and implications for prevention. *Journal of Men's Studies* 9: 81–142.
- Courtenay WH (2000b) Constructions of masculinity and their influence on men's well-being: A theory of gender and health. *Social Science & Medicine* 50: 1385–1401.
- Danish Health Authority (2017) *Danskernes Sundhed* [The Health of Danes]. Copenhagen: Sundhedsstyrelsen.
- Doolen J, Alpert PT and Miller SK (2009) Parental disconnect between perceived and actual weight status of children: A metasynthesis of the current research. *Journal of the American Academy of Nurse Practitioners* 21: 160–169.
- Due P, Heitman BL and Sørensen TIA (2007) Prevalence of obesity in Denmark. *Obesity Reviews* 8: 187–189.
- Festinger H (1954) A theory of social comparison processes. *Human Relations* 7: 117–140.
- Frederick DA, Buchanan GM, Sadehgi-Azar L, et al. (2007) Desiring the muscular ideal: Men's body satisfaction in the United States, Ukraine, and Ghana. *Psychology of Men & Masculinity* 8: 103–117.
- Frederick DA, Daniels EA, Bates ME, et al. (2017) Exposure to thin-ideal media affects most, but not all, women: Results from the perceived effects of media exposure scale and open-ended responses. *Body Image* 23: 188–205.
- Furnham A, Badmin N and Sneade I (2002) Body image dissatisfaction: Gender differences in eating attitudes, self-esteem, and reasons for exercise. *Journal of Psychology* 136: 581–596.
- Goodman E, Hinden BR and Khandelwal S (2000) Accuracy of teen and parental reports of obesity and body mass index. *Pediatrics* 106: 52–58.
- Gorber SC, Tremblay M, Moher D, et al. (2007) Diagnostic in obesity comorbidities—A comparison of direct vs. self-report measures for assessing height, weight and body mass index: A systematic review. *Obesity Reviews* 8: 307–326.
- Grabe S, Ward LM and Hyde JS (2008) The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin* 134: 460–476.
- Groesz LM, Levine MP and Murnen SK (2002) The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of Eating Disorders* 31: 1–16.
- Grogan S (2008) *Body Image: Understanding Body Dissatisfaction in Men, Women, and Children* (2nd edn). London: Routledge.
- Hammond RA (2010) Social influence and obesity. *Current Opinion in Endocrinology, Diabetes, and Obesity* 17: 467–471.
- Hammond RA and Ornstein JT (2014) A model of social influence on body mass index. *Annals of the New York Academy of Sciences* 1331: 34–42.
- Johnson F, Cooke L, Croker H, et al. (2008) Changing perceptions of weight in Great Britain: Comparison of two population surveys. *British Medical Journal* 337: a494.
- Johnson-Taylor WL, Fisher RA, Hubbard VS, et al. (2008) The change in weight perception of weight status among the overweight: Comparison of NHANES III (1988–1994) and 1999–2004 NHANES. *International Journal of Behavioral Nutrition and Physical Activity* 5: 9.
- Krones PG, Stice E, Batres C, et al. (2005) In vivo social comparison to a thin-ideal peer promotes body dissatisfaction: A randomized experiment. *International Journal of Eating Disorders* 38: 134–142.
- Leahey TM and Crowther JH (2008) An ecological momentary assessment of comparison target as a moderator of the effects of appearance-focused social comparisons. *Body Image* 5: 307–311.
- Leahey TM, Crowther JH and Ciesla JA (2011a) An ecological momentary assessment of the effects of weight and shape social comparisons on women with eating pathology, high body dissatisfaction, and low body dissatisfaction. *Behavior Therapy* 42: 197–210.
- Leahey TM, LaRose JG, Fava JL, et al. (2011b) Social influences are associated with BMI and weight loss intentions in young adults. *Obesity* 19: 1157–1162.
- Leit RA, Pope HG and Gray JJ (2000) Cultural expectations of muscularity in men: The evolution of playgirl centrefolds. *International Journal of Eating Disorders* 29: 90–93.
- Lemon SC, Rosal MC, Zapka J, et al. (2009) Contributions of weight perceptions to weight loss attempts: Differences by body mass index and gender. *Body Image* 6: 90–96.

- McAdams MA, Van Dam RM and Hu FB (2007) Comparison of self-reported and measured BMI as correlates of disease markers in US adults. *Obesity* 15: 188–196.
- McCreary DR and Sasse DK (2000) An exploration of the drive for muscularity in adolescent boys and girls. *Journal of American College Health* 48: 297–304.
- Maximova K, McGrath JJ, Barnett T, et al. (2008) Do you see what I see? Weight status misperception and exposure to obesity among children and adolescents. *International Journal of Obesity* 32: 1008–1015.
- Mueller AS, Pearson J, Muller C, et al. (2010) Sizing up peers: Adolescent girls' weight control and social comparison in the school context. *Journal of Health and Social Behavior* 51: 64–78.
- Myers TA and Crowther JH (2009) Social comparison as a predictor of body dissatisfaction: A meta-analytic review. *Journal of Abnormal Psychology* 118: 683–698.
- Owen R and Spencer RMC (2013) Body ideals in women after viewing images of typical and healthy weight models. *Body Image* 10: 489–494.
- Papies EK and Nicolaijé KAH (2012) Inspiration or deflation? Feeling similar or dissimilar to slim and plus-size models affects self-evaluation of restrained eaters. *Body Image* 9: 76–85.
- Pope HG, Olivardia R, Gruber A, et al. (1999) Evolving ideals of male body image as seen through action toys. *International Journal of Eating Disorders* 26: 65–72.
- Pulvers KM, Kaur H, Nollen NL, et al. (2008) Comparison of body perceptions between obese primary care patients and physicians: Implications for practice. *Patient Education and Counseling* 73: 73–81.
- Renehan AG, Tyson M, Egger M, et al. (2008) Body-mass index and incidence of cancer: A systematic review and meta-analysis of prospective observational studies. *The Lancet* 371: 569–578.
- Robinson E (2017) Overweight but unseen: A review of the underestimation of weight status and a visual normalization theory. *Obesity Reviews* 18: 1200–1209.
- Robinson E and Kirkham TC (2014) Is he a healthy weight? Exposure to obesity changes perception of the weight status of others. *International Journal of Obesity* 38: 663–667.
- Smeesters D, Mussweiler T and Mandel N (2009) The effects of thin and heavy media images on overweight and underweight consumers: Social comparison processes and behavioral implications. *Journal of Consumer Research* 36: 930–949.
- Spencer EA, Appleby PN, Davey GK, et al. (2001) Validity of self-reported height and weight in 4808 EPIC–Oxford participants. *Public Health Nutrition* 5: 561–565.
- Stanford JN and McCabe MP (2002) Body image ideal among males and females: Sociocultural influences and focus on different body parts. *Journal of Health Psychology* 7: 675–684.
- Stibbe A (2004) Health and the social construction of masculinity in men's health magazine. *Men and Masculinities* 7: 31–51.
- Striegel-Moore RH and Franko DL (2002) Body image issues among girls and women. In: Cash TF and Pruzinsky T (eds) *Body Image: A Handbook of Theory, Research, and Clinical Practice*. New York: Guilford Press, pp. 183–191.
- Striegel-Moore RH, Franko DL, Thompson D, et al. (2004) Changes in weight and body image over time in women with eating disorders. *International Journal of Eating Disorders* 36: 315–327.
- Tantleff-Dunn S and Gokee JL (2002) Interpersonal influences on body image development. In: Cash TF and Pruzinsky T (eds) *Body Image: A Handbook of Theory, Research, and Clinical Practice*. New York: Guilford Press, pp. 108–116.
- Tiggemann M, Martins Y and Kirkbride A (2007) Oh to be lean and muscular: Body image ideals in gay and heterosexual men. *Psychology of Men & Masculinity* 8: 15–24.
- Tovee MJ, Emery JL and Cohen-Tovee EM (2000) The estimation of body mass index and physical attractiveness is dependent on the observer's own body mass index. *Proceedings: Biological Sciences* 267: 1987–1997.
- Trogdon JG, Nonnemaker J and Pais J (2008) Peer effects in adolescent overweight. *Journal of Health Economics* 27: 1388–1399.
- Trottier K, Polivy J and Herman CP (2007) Effects of exposure to thin and overweight peers: Evidence of social comparison in restrained and unrestrained eaters. *Journal of Social and Clinical Psychology* 26: 155–172.
- Tucci S and Peters J (2008) Media influences on body satisfaction in female students. *Psicothema* 20: 521–524.
- Uccella A and Nuvoli G (2017) Parent-child discrepancy on children's body weight perception: The role of attachment security. *Frontier Psychology* 8: 1500.
- Vella-Zarb RA and Mills JS (2011) Weight criticalness of others in restrained and unrestrained eaters. *Body Image* 8: 157–162.
- Wang YC, McPherson K and Marsh T (2011) Health and economic burden of the projected obesity trends in the USA and the UK. *The Lancet* 378: 815–825.
- Wardle J, Haase AM and Steptoe A (2006) Body image and weight control in young adults: International comparisons in university students from 22 countries. *International Journal of Obesity* 30: 644–651.
- Warren CS, Schoen A and Schafer KJ (2010) Media internalization and social comparison as predictors of eating pathology among Latino adolescents: The moderating effect of gender and generational status. *Sex Roles* 63: 712–724.
- Withrow D and Alter DA (2011) The economic burden of obesity worldwide: A systematic review of the direct costs of obesity. *Obesity Reviews* 12: 131–142.
- World Health Organization (WHO) (2000) *Obesity: Preventing and managing the global epidemic*. Report of a WHO consultation series 894. Geneva: WHO.
- Yaemsiri S, Slining MM and Agarwal SK (2011) Perceived weight status, overweight diagnosis, and weight control among US adults: The NHANES 2003–2008 Study. *International Journal of Obesity* 35: 1063–1070.
- Zhang S, Haye K, Ji M, et al. (2018) Applications of social network analysis to obesity: A systematic review. *Obesity Reviews* 19: 976–988.